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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/730,781

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Jonathan Herman Fischer

FISCHER 35-47-14

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EXAMINER

BRINEY III, WALTER F

ART UNIT

PAPER NUMBER

2646

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/730,781

Applicant(s)

FISCHER ET AL.

Examiner

Walter F. Briney III

Art Unit

2646

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,10,12-15,20-23,25,32 and 33 is/are rejected.
- 7) ☒ Claim(s) 2,7-9,11,16-19,24,26-31 and 34 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. **Claims 1, 3-6, 10, 12-15, 20-23, 25, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freeman (US Patent 5,930,310) in view of Myers (US Patent 5,570,395).**

**Claim 1** is limited to a *DSL front end*. Freeman discloses an interference reduction scheme and method. See Abstract thereof. In operation, an interfering common mode signal (32) scaled by the multiplier (37) and the outputs of the DSP (36) and the processor (38) is substantially removed from the received differential signal (31). As disclosed, this cancellation scheme is regarded as a filtering scheme. See column 4, line 29, through column 5, line 10, in particular, column 4, line 57, through column 5, line 10. In addition, the RF interference cancellation scheme of Freeman is clearly directed for use with DSL front ends. The demodulator circuit of figure 3 operates only on received DSL signals. Thus, while not explicitly disclosed, a hybrid inherently exists to form a link between the two-wire subscriber loop (24) of figure 2 and the apparently four-wire loop of figure 3. In summary, Freeman provides RF interference cancellation, including AM interference cancellation, but to those of ordinary skill in the art, it is apparent that the filtering scheme disclosed by Freeman

does not provide AM interference cancellation based on a carrier component of AM interference while ignoring a sideband component.

Myers teaches the replacement of filter-based RF interference cancellation with PLL-based RF interference cancellation that only detects interfering carrier components while ignoring a sideband component, see Background Art and disclosure of Invention, columns 1 and 2. It would have been obvious to one of ordinary skill in the art at the time of the invention to replace filtering-based interference cancellation with carrier-based interference cancellation as taught by Myers for the purpose of reducing the chance of distorting a wanted differential signal within the DSL front end of Freeman.

**Claim 10** is limited to *a digital subscriber line front end*. As described in the rejection of claim 1, the combination of Freeman in view of Myers makes obvious an AM interference canceller module. However, it has not been shown that a reference AM radio frequency signal receiver receives an AM interference with an antenna. In the combination of Freeman and Myers, it is clear that the above ground subscriber loop (24) acts as an antenna for receiving radio frequency interference. Therefore, Freeman in view of Myers makes obvious all limitations of the claim.

**Claim 20** is limited to *a method of canceling an AM interference signal from a digital subscriber line signal*. As shown in the rejection of claim 10, Freeman in view of Myers makes obvious an apparatus for reducing said interference by detecting interference with an above ground subscriber loop, generating a cancellation signal therefrom using a phase locked loop, and combining said cancellation signal with the

corrupted received DSL signal to recover the desired DSL signal therefrom. Therefore, Freeman in view of Myers makes obvious all limitations of the claim.

**Claim 32** is limited to *an apparatus for cancelling an AM interference signal from a digital subscriber line signal*. As shown in the rejection of claim 10, Freeman in view of Myers makes obvious an apparatus for reducing said interference by detecting interference with an above ground subscriber loop, generating a cancellation signal therefrom using a phase locked loop, and combining said cancellation signal with the corrupted received DSL signal to recover the desired DSL signal therefrom. Therefore, Freeman in view of Myers makes obvious all limitations of the claim.

**Claim 3** is limited to *the DSL front end according to claim 1*, as covered by Freeman in view of Myers. Freeman discloses that RF interference cancellation is performed within an ADSL front end. See column 3, lines 60-64. Therefore, Freeman in view of Myers makes obvious all limitations of the claim.

**Claims 12 and 25** recite essentially the same subject matter as claim 3, and are rejected for the same reasons.

**Claim 4** is limited to *the DSL front end according to claim 1*, as covered by Freeman in view of Myers. The interference cancellation circuit (24) of Myers separates interfering radio waves using summation device (19). The amount of differential mode coupling of said interfering AM radio wave is identified as the error in the output of the summation device, and as such, is determined with respect to the common mode coupling of said interfering AM radio wave. This error is part of the phase locked loop

(20), and goes toward adapting the interference canceller. Therefore, Freeman in view of Myers makes obvious all limitations of the claim.

**Claims 13 and 33** recite essentially the same subject matter as claim 4, and are rejected for the same reasons.

**Claim 5** is limited to *the DSL front end according to claim 1*, as covered by Freeman in view of Myers. Within the interference cancellation circuit (24) of Myers, a reference AM radio wave receiver is provided by way of separation circuit (25). Therefore, Freeman in view of Myers makes obvious all limitations of the claim.

**Claim 14** recites essentially the same subject matter as claim 5, and is rejected for the same reasons.

**Claim 6** is limited to *the DSL front end according to claim 1*, as covered by Freeman in view of Myers. As part of the reference signal generation described in the rejection of claim 5, a phase locked loop (10) is included. This phase lock loop detects carrier components within a signal. Therefore, Freeman in view of Myers makes obvious all limitations of the claim.

**Claim 15** recites essentially the same subject matter as claim 6, and is rejected for the same reasons.

**Claim 21** is limited to *the method of canceling an AM interference signal from a digital subscriber line signal according to claim 20*, as covered by Freeman in view of Myers. The result of interference cancellation provided by summation device (19) of Freeman results in an intrinsic determination of an amount of differential mode coupling

of said interfering AM radio signal in said digital subscriber line signal. Therefore, Freeman in view of Myers makes obvious all limitations of the claim.

**Claim 22** is limited to *the method of canceling an AM interference signal from a digital subscriber line signal according to claim 20*, as covered by Freeman in view of Myers. The result of separation provided by separation circuit (25) of Freeman results in an intrinsic determination of an amount of common mode coupling of said interfering AM radio signal in said digital subscriber line signal. Therefore, Freeman in view of Myers makes obvious all limitations of the claim.

**Claim 23** is limited to *the method of canceling an AM interference signal from a digital subscriber line signal according to claim 20*, as covered by Freeman in view of Myers. The summation result from summer (19) of Freeman determines the ratio of differential mode coupling with respect to the common mode determination from separation circuit (25). Therefore, Freeman in view of Myers makes obvious all limitations of the claim.

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### ***Allowable Subject Matter***

The following is a statement of reasons for the indication of allowable subject matter:

2. **Claims 2, 7-9, 11, 16-19, 24, 26-31 and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.**

**Claim 2** is limited to *the DSL front end according to claim 1*, as covered by Freeman in view of Myers. In both Freeman and Myers, the summation device used for

cancellation of RF interference from the desired signal is an analog device. Therefore, Myers in view of Freeman makes obvious all limitations of the claim with the exception wherein said summer is a digital summer. Even though the filter of Freeman has been replaced with the carrier reduction scheme of Myers, cancellation is meant to be performed in an analog domain, reducing distortion to the output of the ADC. See column 1, lines 23-42, of Freeman. Thus, claim 2 is allowable over Freeman in view of Myers.

**Claims 11 and 24** recite essentially the same subject matter as claim 2, and are allowable over Freeman in view of Myers for at least the same reasons.

**Claim 7** is limited to *the DSL front end according to claim 1*, as covered by Freeman in view of Myers. Quite clearly, none of the components described within either Freeman nor Myers correspond to a Hilbert bandpass filter. Thus, claim 7 is allowable over Freeman in view of Myers.

**Claims 16, 26 and 34** recite essentially the same subject matter as claim 7, and are allowable over Freeman in view of Myers for at least the same reasons.

**Claim 8** is limited to *the DSL front end according to claim 7*, and, therefore, is allowable over Freeman in view of Myers for at least the same reasons.

**Claim 9** is limited to *the DSL front end according to claim 7*, and, therefore, is allowable over Freeman in view of Myers for at least the same reasons.

**Claim 17** is limited to *the digital subscriber line front end according to claim 16*, and, therefore, is allowable over Freeman in view of Myers for at least the same reasons.



**Claim 18** is limited to *the digital subscriber line front end according to claim 16*, and, therefore, is allowable over Freeman in view of Myers for at least the same reasons.

**Claim 27** is limited to *the method of canceling an AM interference signal from a digital subscriber line signal according to claim 26*, and, therefore, is allowable over Freeman in view of Myers for at least the same reasons.

**Claim 28** is limited to *the method of canceling an AM interference signal from a digital subscriber line signal according to claim 27*, and, therefore, is allowable over Freeman in view of Myers for at least the same reasons.

**Claim 29** is limited to *the method of canceling an AM interference signal from a digital subscriber line signal according to claim 28*, and, therefore, is allowable over Freeman in view of Myers for at least the same reasons.

**Claim 19** is limited to the digital subscriber line front end according to claim 10, as covered by Freeman in view of Myers. While Myers teaches providing AM interference cancellation using phase locked loops, which corresponds to carrier recovery phase locked loops tuned to a most significant frequency of an interfering AM radio signal, there is no suggestion to provide sine and cosine gain adjustment. Thus, claim 19 is allowable over Freeman in view of Myers.

**Claim 30** recites essentially the same subject matter as claim 19, and is allowable over Freeman in view of Myers for at least the same reasons.

**Claim 31** is limited to *the method of canceling an AM interference signal from a digital subscriber line signal according to claim 30*, and, therefore, is allowable over Freeman in view of Myers for at least the same reasons.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-34 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F. Briney III whose telephone number is 571-272-7513. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WFB  
9/6/05

  
**SINH TRAN**  
**SUPERVISORY PATENT EXAMINER**